REMARKS

Claims 2, 13, 15, 25, and 26 have been canceled and claims 1, 3, 11, 12, 14, 16-18, 23, 24, and 27 have been amended. Thus, claims 1, 3-12, 14, 16-24, 27, and 28 are currently pending in the case. Further examination and reconsideration of the presently claimed application are respectfully requested.

Section 102 Rejection

Claims 1-7 and 9-28 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,283,840 to Huey (hereinafter "Huey"). Claims 1-13, 18-21, and 23-28 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,475,070 to White (hereinafter "White"). Claims 3, 13, 15, 25, and 26 have been canceled and, thus, their rejections are moot. The standard for "anticipation" is one of fairly strict identity. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), MPEP 2131. Neither Huey nor White discloses all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

None of the cited art discloses a polishing system with a spray element and a dispense component configured to be arranged adjacent to opposite edges of a semiconductor topography during a polishing process. Amended claim 1 recites in part:

> A polishing system, comprising: a polishing pad; a spray element ... configured to be arranged adjacent to an edge of the semiconductor topography which the polishing pad is moving away from during the polishing process; and a dispense component ... configured to be arranged adjacent to an opposite edge of the semiconductor topography which the polishing pad is moving toward during the polishing process.

Support for such an amendment may be found in the specification, for example, on page 15, lines 9-12: "In one embodiment, spray element 16 may be spaced adjacent to semiconductor topography 14, particularly in an area above a given portion of polishing pad 12 after semiconductor topography 14 (following the direction of the movement of polishing pad 12)." Additional support may be found, for example, on page 16, lines 4-6 of the specification: "Dispense component 18 may be spaced adjacent to semiconductor topography 14, particularly in the area above a given portion of polishing pad 12 before the

topography relative to direction 13." Moreover, Figs. 1 and 2 illustrate polishing systems with spray elements and dispense components arranged in the manner recited in claim 1.

Huey discloses a polishing system with a single component adapted to introduce slurry on to a polishing pad as well as remove residues from the polishing pad. In particular, Huey discloses "... arm assembly 60 serv[ing] two main purposes: to spread slurry over the surface of the pad in a thin layer, and to remove residues and contaminants, such as residual slurry, dirt, dust, abraded substrate material, abraded polishing pad material and other contaminants that would have a material adverse affect on the polishing process, from the polishing pad surface." (Huey, column 3, lines 44-50). As such, Huey does not disclose a polishing system with two separate components which are adapted for such functions and are arranged along opposite sides of a semiconductor topography as recited in the presently claimed case. Furthermore, there is no motivation within Huey to teach a polishing system with such a configuration. For example, even if Huey taught a polishing system with separate components for spreading slurry over a polishing pad and removing residues therefrom, there is no teaching or suggestion within Huey to arrange the components such that they are arranged adjacent to opposite edges of a topography polished by the system. Moreover, there is no teaching or suggestion with Huey to arrange components of the polishing system relative the direction of movement of the polishing pad. As such, it is asserted that Huey does not teach, suggest, or provide any motivation to teach the limitations of claim 1.

In addition, White does not teach, suggest, or provide any motivation to teach the limitations of claim 1. In particular, White does not discuss the position of slurry/rinse arm 52 relative to a semiconductor topography to be polished and/or the direction of movement of a polishing pad within polishing apparatus 20. In fact, White does even discuss the position of slurry/rinse arm 52 relative to any components within polishing apparatus 20. White does illustrate polishing system 20 in Fig. 1 with a similar configuration to that of the polishing system illustrated in Fig. 1 of Huey. In particular, White illustrates slurry/rinse arm 52 in a substantially similar arrangement as assembly arm 60 in Fig. 1 of Huey. Consequently, one skilled in the art would presume that the arrangement of the components in White were substantially similar to that of the arrangement of components within the polishing system taught in Huey, absent any teaching or suggestion otherwise. As noted above, Huey does not teach or suggest the limitations of claim 1. As such, there is no teaching or motivation within White to teach a polishing system with separate components for introducing slurry over a polishing pad and removing residues therefrom, which are arranged adjacent to opposite edges of a topography polished by the system. Furthermore, there is no teaching or suggestion within White to arrange such components relative to the

direction of movement of a polishing pad as recited claim 1. Consequently, it is asserted that claim 1 is patentably distinct over the cited art.

None of the cited art discloses a spray element which is adapted to be positioned within a polishing system and includes a plurality of spray nozzles and one or more adjustable shields arranged about the plurality of nozzles. Amended claim 11 recites in part: "A spray element adapted to be positioned within a polishing system ... wherein the spray element comprises a plurality of nozzles ... and one or more adjustable shields arranged about the plurality of nozzles." Support for such an amendment may be found, for example, on page 23, lines 8-9 of the Specification, "... the position of shields 44 relative to outer casing 42 may be adjusted by sliding shields 44 via slot 46." White does not teach or suggest slurry/rinse arm 52 having shields arranged about nozzles. As such, White cannot anticipate the limitations of claim 11 or render the limitations of claim 11 obvious in light of the teachings therein.

Huey, on the other hand does teach assembly arm 60 having assembly housing 64 and retainer 78 configured to form chamber 66 above polishing pad 54. Consequently, assembly arm 60 is configured to prevent the dispersion of fluid from nozzles arranged within the assembly arm. Huey, however, does not teach assembly housing 64 having adjustable shields. In particular, Huey illustrates assembly housing 64 having a unitary body and, therefore, cannot be adjustable as recited in the presently claimed case. Consequently, Huey cannot anticipate the limitations of claim 11. In addition, there is no motivation within Huey to teach the limitations of claim 11. In particular, Huey teaches interposing retainer 78 between assembly housing 64 and polishing pad 54 to form "... a dam to retain slurry and rinse water within a reservoir formed by the retainer and pad." (Huey, column 4, lines 42-43). As such, there is no motivation to allow assembly housing 64 to be adjustable since shortening the sidewalls of assembly housing 64 would prevent the formation of a dam upon polishing pad 54. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) MPEP 2143.01. Consequently, it is asserted that claim 11 is patentably distinct over the cited art.

None of the cited art discloses a method for cleaning a polishing pad which includes spraying a pressurized fluid in a pulsating sequence upon the polishing pad. Amended claim 18 recites in part: "A method for cleaning a polishing pad, comprising ... spraying a pressurized fluid in a

pulsating sequence from the spray element upon the polishing pad ..." Support for such an amendment may be found, for example, on page 26, lines 8-9 of the Specification: "In some embodiments, the spray element may be activated in a pulsing sequence." Neither Huey nor White teaches spraying a pressurized fluid in a pulsating sequence to clean a polishing pad. As such, neither Huey nor White can anticipate the limitations of claim 18. Furthermore, without any teaching or suggestion of spraying a pressurized fluid in a pulsating sequence, the cited art cannot provide any motivation to teach a method for cleaning a polishing pad with such a limitation. Consequently, claim 18 is asserted to be patentably distinct over the cited art.

None of the cited art discloses a method which includes measuring the amount of matter adhered to a polishing pad and subsequently spraying a pressurized fluid upon the polishing pad based upon the measured amount. Amended claim 23 recites in part: "A method for polishing multiple semiconductor topographies, comprising ... measuring an amount of matter adhered to the polishing pad subsequent to said polishing; spraying a pressurized fluid from the spray element upon the polishing pad while moving the polishing pad, wherein said spraying is conducted based upon the amount of matter measured ..." Support for such an amendment may be found in the specification, for example, on page 25, lines 1-2, "... the spray element may be activated by upon accumulating a specific amount of matter upon the polishing pad." Neither Huey nor White teach or suggest measuring the amount of matter upon a polishing pad, much less basing the activation of the spray bars described therein upon such a measurement. As such, neither Huey nor White can anticipate the limitations of claim 23. Furthermore, without any teaching or suggestion of basing the activation of a spray bar upon the measurement of the amount of matter upon a polishing pad, the cited art cannot provide any motivation to teach a method for polishing semiconductor topographies with such a limitation. Consequently, claim 23 is asserted to be patentably distinct over the cited art.

For at least the reasons stated above, none of the cited art teaches or suggests the limitations of claims 1, 11, 18, or 23. Therefore, claims 1, 11, 18, and 23, as well as claims dependent therefrom, are patentably distinct over the cited art. Accordingly, removal of the § 102(e) rejection of claims 3-10, 12, 14, 16, 17, 19-22, 24, 27 and 28 is respectfully requested.

In addition to being patentable for reasons set forth above, several of the dependent claims are believed to be separately patentable for reasons set forth below.

Dependent claim 10 specifies that the spray element of claim 1 is adaptable for removal from the polishing system. Dependent claim 17 is directed to a similar limitation by specifying that the spray element include a mounting structure with which to couple the spray element to the polishing system. Neither Huey nor White teach or suggest a spray bar which is adapted for removal from their respective polishing systems. In fact, White does not even mention moving slurry/rinse arm 52. Huey, on the other hand, teaches "The assembly arm 60 may be designed and configured to pivot about support post 62 ..." (Huey, column 3, lines 52-53). However, such a teaching does not suggest removal of assembly arm 60 from the polishing system. Rather, Huey teaches such a pivoting motion such that assembly arm 60 may "... sweep across the surface of the polishing pad 54." (Huey, column 3, line 54).

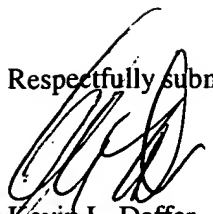
Claim 14 references the spray distribution from one nozzle to overlap a spray distribution in an adjacent nozzle. As shown in Fig. 3 of Huey, nozzles 72 are sufficiently spaced apart such that the spray distribution from the nozzles does not overlap. White does not even discuss or illustrate the distribution of nozzles within slurry/rinse arm 52. Therefore, neither Huey nor White teach or suggest the limitations of claim 14.

CONCLUSION

This response constitutes a complete response to all issues raised in the Office Action dated November 20, 2002. In view of the remarks traversing the rejections, Applicants assert that pending claims 1, 3-12, 14, 16-24, 27, and 28 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees, which may be required, or credit any overpayment, to Conley Rose, P.C. Deposit Account No. 03-2769/5298-05700.

Respectfully submitted,



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ATTACHMENT A
"Marked-Up" Amendments

IN THE SPECIFICATION

Please amend pg. 4, lines 9-25 as follows:

In order to increase the effectiveness of a polishing pad in a polishing system, the polishing pad may be cleaned periodically. Such a process is typically a sporadic manual process which involves shutting down the polishing system and depositing water upon the pad in an effort to suspend the particles in solution and subsequently wash them away. Unfortunately, such a process typically does not remove all matter from the pad. More specifically, the conventional cleaning process may only be able to suspend matter loosely adhered to the polishing pad. As such, the current cleaning process may not be able to dislodge all matter adhered to the polishing pad. Consequently, the polishing performance and efficiency of the system may degrade more quickly since additional matter may build upon the remaining matter. In addition, such a cleaning process is typically performed when the [P]polishing system is not in use. Typically, in order to reduce downtime of the [P]polishing system, the cleaning process is performed after a specific number (e.g., 25) of wafers has been processed. In this manner, as the polishing process continues, matter continues to accumulate upon the polishing pad and uniformity from wafer to wafer decreases. Furthermore, since the process is manual, the length and the coverage of the cleaning process may vary. As such, the performance and efficiency of the [P]polishing system may vary, thereby reducing the process capability of the system.

Please amend pg. 8, lines 9-25 as follows:

There may be several advantages to creating a method and system to remove the build-up of matter upon a polishing pad during a CMP process. For example, the fact that the system is incorporated into the CMP process may minimize interruption of the polishing process. Consequently, production throughput may be increased. In addition, the spray element included in such a system is preferably adapted to spray a fluid at a sufficient pressure such that essentially all of the matter is removed from the pad. In this manner, the pad may be cleansed completely before polishing one or more wafers. Conventional methods typically do not remove all of the matter on a pad, thereby jeopardizing the quality of the subsequent polishing process. Furthermore, the process described herein does not require manual intervention. In other words, the activation, length, and coverage of the process may be maintained in a consistent manner. In this

manner, the pad may be consistently cleaned in the same manner. The variation attributed with the manual process is eliminated, thereby improving the process capability of the cleaning process and consequently the polishing process. Another advantage of the system as described herein is that it is configured to easily mount into the [P]polishing system along with being very easy to remove. In this manner, the tool may be easily accessed for maintenance issues.

Please amend pg. 26, lines 17-27 as follows:

In the event that the spray element is not programmed to spray, the topography positioned within the system may be replaced by another semiconductor topography as shown in step 66. The method may then continue through steps 61 and 64 as described above. Upon a time when the spray bar is programmed to spray, the method may continue to step 68 to spray a pressurized fluid from the spray element while continuing to move the polishing pad. Consequently, the method may include removing matter adhered to the polishing pad as shown in step 70. Either after or during steps 68 and 70, the polished topography may be replaced by another semiconductor topography. In this manner, the method of removing matter adhered to the polishing pad may be conducted while the [P]polishing system is activated. In other words, the [P]polishing system does not have to be shut down to remove matter adhered to the polishing pad.

Please amend pg. 29, lines 8-17 as follows:

It will be appreciated to those skilled in the art having the benefit of this disclosure that this invention is believed to provide a method and a system for cleaning a polishing pad. Further modifications and alternative embodiments of various aspects of the invention will be apparent to those skilled in the art in view of this description. For example, the system as described herein may be applied to a [P]polishing system which is adapted to polish a plurality of topographies. In addition, the system may be used for polishing a variety of materials, such as dielectric and conductive materials. It is intended that the following claims be interpreted to embrace all such modifications and changes and, accordingly, the drawings and the specification are to be regarded in an illustrative rather than a restrictive sense.

IN THE CLAIMS

Please cancel claims 2, 13, 15, 25, and 26. Please amend claims 1, 3, 11, 12, 14, 16-18, 23, 24, and 27 as follows. Also following is a list of all the pending claims.

1. (Amended) A polishing system, comprising:

a polishing pad; [and]

a spray element adapted to spray a pressurized fluid upon the polishing pad to remove matter adhered to the pad, wherein said matter is adhered to the polishing pad during a polishing process of a semiconductor topography, and wherein the spray element is configured to be arranged adjacent to an edge of the semiconductor topography which the polishing pad is moving away from during the polishing process; and

a dispense component adapted to dispense a polishing fluid onto the polishing pad during said polishing process, wherein the dispense component is configured to be arranged adjacent to an opposite edge of the semiconductor topography which the polishing pad is moving toward during the polishing process.

2. (Canceled)

3. (Amended) The system of claim [2] 1, wherein said matter comprises particles from the polishing fluid.

4. The system of claim 1, wherein said matter comprises particles from the semiconductor topography.

5. The system of claim 1, adapted to allow the pressurized fluid to be dispensed across the entirety of the polishing pad.

6. The system of claim 1, wherein the spray element is positioned across at least half of the width of the polishing pad.

7. The system of claim 6, wherein the polishing pad comprises a circular pad and the spray element extends across the radius of the polishing pad.

8. The system of claim 6, wherein the polishing pad comprises a belt and the spray element extends across the width of the belt.

9. The system of claim 1, wherein said polishing pad comprises a plurality of pores, and wherein a portion of the matter is embedded within one or more of the pores.

10. The system of claim 1, wherein the spray element is adapted to be removed from the system.

11. (Amended) A spray element adapted to be positioned within a polishing system and[, wherein the spray element is] further adapted to remove matter adhered to a polishing pad of the system by spraying a pressurized fluid upon the polishing pad, wherein the spray element comprises a plurality of nozzles configured to spray the pressurized fluid and one or more adjustable shields arranged about the plurality of nozzles.

12. (Amended) The spray [bar] element of claim 11, wherein the spray element is adapted to be positioned within the polishing system such that the pressurized fluid is dispersed across a region extending across at least half of the width of the polishing pad.

13. (Canceled)

14. (Amended) The spray [bar] element of claim [13] 11, wherein a spray distribution from one of said plurality nozzles overlaps a spray distribution from an adjacent nozzle.

15. (Canceled)

16. (Amended) The spray [bar] element of claim [15] 11, wherein said shields are arranged along the sides of the spray element parallel to the projection of the nozzles.

17. (Amended) The spray [bar] element of claim 11, comprising a mounting structure with which to couple the spray element to the polishing system.

18. (Amended) A method for cleaning a polishing pad, comprising:

moving the polishing pad relative to a spray element, wherein the spray element and polishing pad are positioned within a polishing system such that fluid openings of the spray element are positioned toward the polishing pad;

spraying a pressurized fluid in a pulsating sequence from the spray element upon the polishing pad during said moving; and

removing matter adhered to the polishing pad.

19. The method of claim 18, wherein said spraying is conducted after polishing one or more semiconductor topographies with the polishing system.

20. The method of claim 18, wherein the duration of said spraying is sufficient such that the pressurized fluid is dispensed across the entire upper surface of the polishing pad.

21. The method of claim 18, wherein said spraying comprises spraying the fluid at a sufficient pressure to dislodge the matter adhered to the polishing pad.

22. The method of claim 18, wherein said spraying comprises spraying the fluid at a pressure between approximately 25 psi and approximately 45 psi.

23. (Amended) A method for polishing multiple semiconductor topographies, comprising:

moving a polishing pad with respect to a semiconductor topography and a spray element;

polishing the semiconductor topography by positioning it against the moving polishing pad;

measuring an amount of matter adhered to the polishing pad subsequent to said polishing;

spraying a pressurized fluid from the spray element upon the polishing pad while [continuing to move] moving the polishing pad, wherein said spraying is conducted based upon the amount of matter measured; and

removing matter adhered to the polishing pad.

24. (Amended) The method of claim 23, further comprising[:]

polishing one or more additional topographies prior to said measuring[; and

repeating said spraying and removing after said polishing one or more additional topographies].

25. (Canceled)

26. (Canceled)

27. (Amended) The method of claim [23] 18, wherein said spraying [and said polishing are] is conducted simultaneously with polishing one or more semiconductor topographies with the polishing system.

28. The method of claim 23, further comprising applying a polishing fluid from a dispense component prior to said polishing.